option, if we can work out the structure that everybody understands what's going on and is willing to operate in.

MR. VARMA: Paul, why do you need the force of law? Can you explain that for us, please, a little bit more?

MR. HART: Because we believe, and I think there is a significant amount of agreement in the comments that were made on the record and in the comments that were made, that if the force of law on the harms issue is removed, there is plenty of evidence that that will be abused by various entities and for all kinds of different reasons. And I think that's worth careful thought from the Commission.

On the other hand, the industry is very eager and willing to work with the Commission to develop creative new ways of managing that so it's not such a burden on the Commission, and so that it doesn't result in so much cumbersome regulation and delay.

MR. VARMA: Okay. Clint, did you want to add something to that, please?

MR. PINKHAM: Yeah, one thing if I may. As I mentioned before, I deal with a lot of companies in the Far East who basically do not recognize any standards. They only recognize the rule of law. But there is one other point. The fact that in the United States, the FCC does

have those regulations as part of law means that many, many other countries around the world use the FCC's blessing, if you will, the statement that we meet Part 68, as their entry ticket into other markets, including South America. Just a point.

MR. VARMA: Okay. Yes, John.

MR. SHINN: Thank you. I want to point out one item. In Part 68, rather than having it actually embedded into the rules, using as a pointing to a standard -- for example, in the present situation where for the hearing aid compatibility, we have an ANSI standard that's basically pointed to. And it still has the rule of law or the force of law.

And many countries have accepted the hearing aid compatibility, particularly, Australia, for example. I see either theirs or ours, whichever. And it's common where you can point to something and say, "This is the rule," not just a standard and voluntary. But you're saying mandatory compliance with an external standard. And that presently is used in -- effectively used in the rules.

MR. VARMA: Okay. Are you able to give me any examples in the competitive markets out there other than telecommunications where there are government rules and regs having the force of law, which are required to provide protection to various suppliers? Is there any example that

comes to mind?

Now, I know that in the electric power industry, which I realize is not an exact parallel, there is this Underwriters Laboratories, and there's testing done by them, I suppose. And you can buy electrical appliances in the marketplace that are UL tested or certified or whatever. I don't believe the federal government is involved in giving it the effect of law. Whatever the Underwriters Laboratories rules and regs might be, I don't think that the federal government is involved in ensuring that those rules or testing procedures have the force and effect of law.

Now, I'm not trying to oversimplify it. I realize the differences between the electric power industry on the one hand and the telecom industry on the other. But I am still not a hundred percent comfortable as to why you need the force of law.

MR. SALINAS: Can I use that example?

MR. VARMA: Sure.

MR. SALINAS: The example of the Underwriters Laboratory as far as a consumer is concerned, and the interface associated with this consumer, is a very small portion of that field. There's a larger portion of that field having to do with high-voltage power lines, having to do with substations and stations, where we, as a telephone company, have to interfere with metering circuits, control

circuits and communication circuits.

And within that area with high voltage, there are Part 68 rules that protect are network from power faults at the towers, power faults at the substations and power faults at the power stations which require grounding scenarios, air gap protectors and that technology that is not in the UL listing, and is an area I have to serve. And I have people there that can get shocked and get killed. It is a power fault if I do not have the protection that has alluded me in Part 68. It is not covered in UL at all.

MR. VARMA: So those rules are -- is the federal government involved in that or --

MR. SALINAS: As in Part 68.

MR. VARMA: Okay.

MR. SALINAS: What power can be done at the demark?

MR. VARMA: Okay.

MR. SALINAS: That is covered in Part 68. It is not covered in UL testing, sir.

MR. VARMA: Okay. Go ahead.

MR. HURST: I can respond to that question.

MR. VARMA: Sure.

MR. HURST: When you look at the electrical safety and Underwriters Laboratory, I would think this group here would be scared to death to follow that particular path. As

we look at it, the electrical safety requirements come into play because of a couple of a different reasons.

One, local jurisdictions having authority, almost 14,000 in this country that deal with that. And so, now we're faced with the numerous regulations coming from the local jurisdictions that mandate that that happen.

Within the National Electric Code, it states that your product must be listed by a nationally recognized testing laboratory. It turns out that is a program administered by the U.S. Department of Labor under OSHA. OSHA governs the workplace, and requires that the product be listed. And so, through that system, now we have all kinds of jurisdiction that oversee this. And I think that is a clear point to say, "Why do we want one central focus on what the requirement needs to be?"

And having to deal with just one government agency, with the FCC, this process within Part 68 has been a dream. It has worked extremely well. And to look at other models such as Underwriters Laboratory and how those standards get enforced is really scary.

MR. VARMA: Okay. Paul?

MR. HART: Again, the -- now, somebody needs to help me about this because I was involved in this a long time ago. But the national -- the safety code is a result of a group in Boston, isn't it? The National Fire

Protection Association. And it gets its force by adoption by various regulatory authorities to say, "This is the requirement," in its jurisdiction. And in that case, it requires the registration of -- the testing of equipment that's plugged in.

But the point is, that's a one-way street. All that is is to protect from fire, really. That's primarily what the UL listing is intended for.

I think the best example to maybe respond to your question is radio transmission requirements and frequency stability and so on that are largely governed by the FCC in this country. And I don't think there's any question that if the FCC did not have rules as to how far a carrier frequency could drift off a sign center, they'd be -- they'd be drifting off because you got to still do investigations and have to levy fines on people for not maintaining the right requirements.

Part of what you've got is a problem where you've had a good system that's worked well, and it shows up in a lot of different ways in the regulations. Look at the FAA -- I used to do validations of the FAA TSO rules for aviation equipment. I can guarantee you that if those rules were not there, and if anybody who operated those equipments outside of the rules had behind it the threat of a fine or some action, it would not be as well operated as it is.

So what you're looking for is an example of a problem when our history has been to consider these things very important, and for the industry and the regulators to work very closely in keeping things on track.

And again, the telephone network to me is more analogous to the RF world because in the telephone network, not only are you receiving energy but you are injecting energy into the medium. And that's a huge difference between the power situation. But I think you have the examples you need.

MR. VARMA: Okay. Paul, can you clarify for me about the National Electrical Code that you mentioned earlier in your comments? What was the genesis of that? You made some reference to Boston.

MR. HART: My recall, and I haven't been -- I was -- for awhile, I was actually involved in some of the committee work that led up to the -- and, my recall says it's the National Fire Protection Association, which is a group of folks. I don't know exactly where they come from, but they're based in Boston.

And what they do is continuously upgrade a voluntary industry standard on wiring, on all kinds of practices and procedures. And they publish this on a regular basis. And it becomes force of law in most states or even cities by the governing body declaring that as

requirements to govern codes for wiring and all kinds of practices in their areas.

The National Electric Safety Code is another group I'm much less familiar with. And that determines like high voltage power distribution systems and substations and all that kind of thing.

MR. VARMA: Okay.

MR. BISHOP: I'd like to make the comment that yes, the National Electrical Code is an American national standard. And it has been adopted by many jurisdictions. And the FCC even references it in Part 68. And I think it's a good way in Part 68 to use standards, is by reference.

The particular one in Part 68, we reference the National Electric Code of 1978. So that's probably not a good example of how to reference a standard in Part 68, but certainly it can be done, and there's many people that recommend technical rules themselves could be in the form of an American national standard that is referenced by the FCC.

MR. VARMA: Okay, Trone. Are you saying the National Electrical Code has been adopted by a number of jurisdictions --

MR. BISHOP: Yes --

MR. VARMA: -- sort of on a decentralized basis?

MR. BISHOP: Yes.

MR. VARMA: As opposed to on a centralized basis,

either by the federal government or by some state governments, for example?

MR. BISHOP: Right. As a matter of fact, you -- various localities, they do reference specific versions of the National Electrical Code. So, for example, you may find some city or county or state that has referenced to the 1978 version of the National Electrical Code. So each locality has a particular version.

If we had that for Part 68, that would be disastrous for manufacturers to have to meet all the local rules.

MR. VARMA: Right. Do you know if there has been any effort to centralize the adoption of the National Electrical Code? Because I would agree with you that a centralized mechanism is probably much better and smarter than a decentralized one where every disparity is going on.

So do you know if any effort as far as the National Electrical Code is concerned to address that problem and to adopt it on a centralized basis?

MR. BISHOP: No, I'm not aware of any effort.

MR. VARMA: Cliff, do you want to add something to that?

MR. KENNEDY: Yes. I'm Cliff Kennedy with Sprint. It was our comments that raised the UL question. And I'd like to point out the distinct weakness of that paradigm

here.

And that is that the National Electrical Code gets adopted by local jurisdictions as their local building codes. And so, it is, in effect, enforced by building inspectors, which means new building, refurbished buildings, renovated buildings like that. And so, people who are selling into the retail marketplace are able to ignore that requirement because it is only the building inspectors that enforce it.

MR. VARMA: Okay, thank you. Jim, did you want to add something to that, please?

MR. SALINAS: Yes, sir. Jim Salinas, SBC. The problem was a National Electric Code as it's stated, is adopted by certain organizations and not adopted by other. For example, in the telecommunication industry in the State of California where Pacific Bell is at, the National Electrical Code is not recognized. So they've rewritten their rules that because they are tighter than the National Electric Code.

In other organizations as in the State of Missouri, I have a contingency fight right now between the National Electric Code and the National Electric Safety Code because both of them talk -- National Electric Code says you have to bond. The National Electric and Safety Code, which is not in a building, it's outside in the middle of a field,

says you've got to bond a different way. So there's a rule or regulation that says, which rule complies?

And also, in every other organization or entity that you go to, there is a small statement that says where there are no local codes that override, the National Electric Code complies. So they're given the choice. There is no standard. They're actually given the choice.

MR. SHINN: I want to make one comment. I should have clarified something here. The NFPA, which writes the -- who write a wide variety of actual publications, and one of which is the National Electrical Code. The National Electrical Code is generally distributed and many of the local organizations or jurisdictions used to see these county, states adopt that or use that as a guideline for generating their own codes.

It's pretty well common throughout the United States, except for the City of Chicago. They do their own thing, and as Pac Bell and a few other people. They generate their own codes based on that.

Now, the code itself has no force of law. That's only the jurisdictions which adopt whatever they feel is appropriate out of that. So I'm not really too sure that's truly applicable to a Part 68 issue, which we're considering as a national standard or a national rule of law.

MR. VARMA: Paul?

MR. HART: I agree. The point is we have in front of us an example of an industry standard that is adopted piecemeal and is exactly what's been illustrated around here. You know, you haven't adopted it by year of release, and it creates all kinds of difficulties.

The point is to teach us an important lesson, I think. Number one, it is possible for a regulator to adopt and make force of law out of a set of standards that are developed in an industry body recognized, I think, ANSI. And that's -- we recommended ANSI. The fact is we've got to be careful and thoughtful about how it's done so that it could have the effect of replacing some of the Commission's administrative process in having a consistent set of standards apply to the practice.

MR. SHINN: Getting back to my earlier comment on the pressuring in the rules and the hearing aid compatibility, which is a separate standard that basically pointed to by the Part 68 rules. And the other issues will be coming up here, volume patrol, this type of thing and in your future.

So, that obviously works and the fact that we have in the rules and they point to a national standard -- in fact, again, as an example, in the hearing aid compatibility, rather than incorporating all of that text into the rules. So it functions as a point to this and say

this thing is now -- has the force of law.

MR. VARMA: I'm not sure how many applications we received last year in 1998 for registration of CPE. Kurt, can probably correct me. Is it somewhere in the range of maybe 3,000 per year or something like that?

MR. SCHROEDER: Approximately 3,000.

MR. VARMA: Three thousand. So when you say 3,000 applications for registration last year, and as best I understand, we received no comment on any of these 3,000 applications for registration. Yes, we do go through a lot of paperwork. I think that these applications go to Bell and bank (phonetic) with some money, and then we put them on the Web page and invite comments and things like that.

Even so, even though we don't receive any comments, you continue to feel that all of these Part 68 rules are critical. They're important. And except one or two or three here and there, we need to maintain the body of these Part 68 rules pretty much in their entirety. Nobody will comment on any of this.

MR. SALINAS: Well, the reason we don't have to comment on that is we know we have Part 68 to fall back on. When I get a problem and it involves a piece of CPE equipment that requires more ringing than necessary that hits the line hotter, puts an unbalance and draws AC into the line, I can go to that customer who has bought that

equipment from a manufacturer and say, "Your equipment does not meet these federal rules." And I have the right to take you court and remove that equipment off my network.

And as long as I have that, I don't need to comment.

MR. VARMA: Okay. I think there's a gentleman in the back I would like to request to give his comments.

MR. BIPES: I am John Bipes, Mobile Engineering. And I'm a very small telecom consulting engineer. I work with clients in designing the network interface circuitry. And also I do some Part 68 registration tests.

In response to your question about the fact that there appears to be not much evaluation of the submission once it reaches the FCC, I think the battleground occurs in the registration lab where the rules have the force of law. They're well understood. The back-and-forth conversation occurs between the lab and the client seeking registration. And only after all of the problems are resolved does the submission finally occur.

MR. VARMA: Okay, thank you. Paul?

MR. HART: Paul Hart, USTA. Again, I think that that exact -- this discussion attests to the fact that it would be practical to develop a structure by which the testing laboratory could be able to do self-registration, in essence. And I don't know what you might want to do on an

exception basis.

I can tell you that during the early days of the registration program, there were very considerable comments filed. I did some of that myself, when the rules were being developed and there was some controversy still.

And so, the point is that I think the experience that's been related here attest to the fact that we have reached a point of maturity in the process where given a confident testing laboratories and a good set of solid rules, that some of this administrative stuff can be eliminated. And again, that was in our comments, and we hope that we can work toward an arrangement that allows us to do that.

MR. VARMA: Yes, John?

MR. WAGNER: John Wagner, Lucent Technologies. I'd like to make another point that really hasn't been alluded to here.

As most of the larger telecommunications equipment manufacturers are involved today in the international marketplace, I would agree that the Part 68 rules are adequate. However, there's one area that I think needs to be addressed. And that is, it would be extremely beneficial to those of us who deal in the international marketplace if some of the technical requirements in the rules could be harmonized with those that are common in Europe and other

parts of the world.

We end up doing similar evaluations of the product, perhaps at two or three different standards may require two or three different tests of essentially the same thing. And it would really be very beneficial if those could be harmonized into a single universally accepted set.

MR. VARMA: Okay. I just have one more question before I pass it on to other Commission staff members here on the table. And my question is that the standard network interface or SNI that is now commonly used by the telephone industry at the point of demarkation has certain protective features and some standards built into this standard network interface.

Are there any Part 68 rules that you believe might not be needed because of the protections provided by the SNI?

MR. SALINAS: Yes. There's two ways to answer that. The SNI gives me the basic protection for a slow buildup of high voltage. It was in a certain time period. But there are scenarios where I can have a very, very slow buildup as in dew state induction (phonetic) which will heat up the components and not trigger the SNI.

There's also scenarios where I can have a massive lightning strike immediately, and the voltage rise will be quicker than the SNI will operate. The standard SNI is a

carbon-based device. I can go to a solid state device. I can build a gas cube type device. But even with a gas cube type device, after several hits of high voltage, the gas cube type device no longer works.

So there's -- yes, there's a lot of scenarios where that device does not protect me.

MR. VARMA: Okay. So in your opinion, there are no Part 68 rules that we might not need because of the protection provided by SNI depending upon whether the voltage is building up slowly or rapidly or whatever?

MR. SALINAS: Yes, sir. I'd agree with you. I would like to add the comment that I stated earlier. Some of that documentation that talks about the interface devices of jacks and everything else can be moved to another section I refer to. But definitely the technology portion of it should stay.

MR. VARMA: Trone?

MR. BISHOP: Yes, I agree. In fact, whether or not there is protection at the network interface is determined usually by the National Electrical Code. So you don't always have it at the interface.

But the fact that it is at the interface was taken into consideration when the rules -- particular rules were developed. If you look at the rationale behind some of the rules, they were based on the fact that, for example, the

protector for one conductor would fire, but the other protector would not. The fact that they did both fire, these have been taken into consideration in the development of some of the Part 68 rules.

MR. VARMA: Okay. Thanks, Trone. Susan, I have no more questions. If you can pass it on to someone else.

MS. MAGNOTTI: Any more questions?

MR. BERRESFORD: My name is John Berresford. I'm in the Common Carrier Bureau, senior antitrust lawyer. I would like to thank you all, too, for coming here and for your statements and comments, which have been most helpful to me.

I should also begin by talking about my first involvement in Part 68 back when it was being written. I was a summer intern at AT&T my second year in law school, and I had to lunch many days with the people who were actually writing it or doing their part in it, and was told endless days that this was not going to work. And that even the strictest rules would result in telephone workers getting fatal shocks by the dozen every week, and the phone network would slowly deteriorate. And by 1980, nobody would be able to make phone calls. And at that point, the FCC would finally come to its senses and turn back the clock to the PCAs.

I did not believe it then, and I don't believe it

now. And I have the sense if only from that experience, that Part 68 started out as a kind of a consolation prize for the telephone companies. That, "Look, you folks are going to have to let people buy their own phones, but the consolation prize is that you get to write the technical standards to make sure that those phones don't hurt the phone network."

And I wonder, and I'm just wondering whether any of the general, perceived harms that were perceived back in '74 and '75 have turned out with 20 years experience not to be all that real. And let me just ask one question to start with.

Is there actually CPE, or would there be but for Part 68, which would actually harm telephone company personnel?

MR. SALINAS: Can I give one example?

MR. BERRESFORD: Sure.

MR. SALINAS: One example I would give on a long rural loop or a medium or suburban rural loop is the CPE and I have this connect to CPE of this nature has an improper balance coil on it, it'll cause that line to be an extremely long, unbalanced line. And this scenario we usually share the rung for several miles of the high-voltage power companies. And the high-voltage power companies in the rural areas are usually single phase, double phase. There's

never three phase. There's mostly single phase and double phase.

And in a single-phase scenario, there's a AC field created around that line. And that high AC field when it sees an unbalanced line that parallels it, that goes back to ground, is -- draws into that unbalanced line. So I have seen some scenarios in the rural areas with an unbalanced line where the voltage exceeds 500 amps, I mean, 500 volts on the line.

And my technician on a post that's connecting a pair with 500 volts on it, one of two things. It'll scare him and where he may fall off the post. It'll shock him -- cardiac arrest.

Those scenarios are not allowed because I don't want my technicians having that scenario. I have actually burnt a light bulb off of the AC voltage that's been induced in my central office off of a pair of ACs (phonetic) because of an improperly balanced coil on a piece of CPE.

MR. BERRESFORD: Thank you. Oh, I'm sorry. Yes, sir.

MR. ADORNATO: My name is Pierre Adornato from Northern Telecom. I'd like to tell a little anecdote that addresses the question from Mr. Berresford.

As a part of my career in '82 and '85, I was working in a station in Saudi Arabia. At the time, the

entire telephone network down there was consisting of brand new equipment provided by various European manufacturers. And of course, there's no such thing as Part 68.

During my stay down there, a number of PBX installers started installing new PBX systems and cranking up the signal power to the point where a big, big problem occurred inasmuch as they were spilling over into the other services. As I left in 1985, they were thinking of introducing a Part 68 equivalent.

MR. BERRESFORD: Thank you.

MR. HART: I would just like to say that the Part 68 requirements are such that a manufacturer has to demonstrate the fact that he's not going to induce significant voltage on the line. I think we recognize that unanticipated voltages on the circuit are -- have the potential to be harmful. And I would just suggest that in most current equipment designs, that's not much of a problem. And so, demonstrating the fact that it's safe and will not create those kinds of intrusions onto circuits is probably pretty easy. So that may be a good reason for saying number one, you know it can hurt you if it happens. It's not too difficult for the manufacturers to adhere to.

And so, the conclusion that that would teach to me is that it's a low expense and low issue -- low problem, one

to retain. And it is very helpful. I'm not suggesting that we just use that as a criteria for each one of these. But in this case, I think there's a good case to maintain that requirement.

MR. SALINAS: In addition to that particular statement, in the State of Texas, I keep one manager and several craft people -- nonmanagement people, to do nothing but handle AC-induced problems based on either improperly designed CPE and improperly designed plant. My own outside plant can cause the same scenario or unbalances in the power system. And I don't care how good everything is if your power system is totally unbalanced, it's a major issue.

I received just from the Texas area coming to 200 reports on high AC induction just on my line and just in Texas. That does not include the Pacific area, the Nevada area, southern New England or the other five states associated with this company.

MR. BERRESFORD: Thank you. Okay. I should add that I once worked for a telephone company and did personal injury cases for them. And I worked on a few cases of people who fell off telephone poles and died. So I'm sensitive to all of that.

One other form of harm that is defined by Part 68 as harm is malfunction of telephone company billing equipment. I wonder, does that need to be in a federal law,

or could telephone companies just have in their contracts or their tariffs if a customer connects CPE that bypasses our billing equipment, we will cut your service off? Is this one form of harm that can be dealt with quite satisfactorily by carriers in their contracts with customers or their tariffs and doesn't need a federal law backing it up?

MR. BISHOP: I'd like to comment on that. Not too many years ago, there was an FCC proceeding, I believe, initiated by AT&T involving PBXs that were not returning answer supervision. And this was -- in that particular case, the answer supervision is detected by the local phone company, passed on to the long distance carrier. He starts his billing when the calling party answers. So if answer supervision is not returned, then a person could essentially have a free call.

I don't think -- I think that's a harm to certainly carriers in that case. It's really not in the public interest, either.

And there, the long distance carrier -- the long distance carrier doesn't usually bill the person that receives the call, which in this case was the person that should return the answer supervision. They would normally bill the person that originated the call. So it is only through various --

MR. BERRESFORD: So it is the called party's CPE

that causes the problem in that case?

MR. BISHOP: Yes.

MR. BERRESFORD: And that might be in California where --

MR. BISHOP: Yes --

MR. BERRESFORD: -- you don't serve?

MR. BISHOP: Yes.

MR. BERRESFORD: And so, you couldn't threaten to cut off that customer's service?

MR. BISHOP: Right. So, for example, if you sold long distance service to a customer in New Jersey and you said, "You must" -- you know, "We require you to have CPE that doesn't make our billing system malfunction," they might comply. But they make a phone call to a person in California who's got noncompliant equipment. You don't have a contract with that person other than in an around about way through agreements with other carriers to complete that call.

MR. BERRESFORD: Mr. Pinkham?

MR. PINKHAM: Clint Pinkham of Thomson. Thomson was one of the developers of a satellite system, basically cable TV kind of system through satellites. And like other such systems, we were faced with the biggest most serious, most important question of all, which is how are you going to get paid for this? And if there is a section of the

harms definition that I believe is superfluous, it has to be the billing. I have infinite faith in the ability of service providers to work something out so that they will get paid. Thank you.

MR. BERRESFORD: Thank you.

MR. SALINAS: An example of how you harm the network, and you not being in a contract with a provider -- a service provider. I recently worked an issue on what's called an ISDN smart trunk as to where the pipe turns up the amount of trunks the customer needs at the time. And it became to be a supervision issue and a billing issue.

The final gist of the matter is when we finally got out there to look at the issue, it was not the customer and myself's interface that was causing the lack of data to be sent back and forth to bill the initiation of the call and the end of the call. It was adjacent people in the same cable who -- cable that was drawing -- was going to ground improperly and drawing large hums into the line. And the hums was the odd harmonics associated with it, were such a frequency that it got on the same frequency as the billing information, was going back and forth.

It was not myself, nor my customer. It was other people in the same cable.

MR. BISHOP: Yes. If you actually look at the number of rules in Part 68 related to this particular harm,